SD-99304-01

SHEET INDEX

SHEET NO.	CONTENTS
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2	FS 1 CONTROL CIRCUIT FS 2 TIMER CIRCUIT
3	APP FIG. 1, 2
4	SC 1
5	CIRCUIT REQUIREMENT TABLE CAD 1

CIRCUIT NOTES:

101.

DESIG	FUSE AMP	POTENTIAL	ONE PER
	1-1/3	-48 SIG	APP FIG. 1
		GRD	APP FIG. 1

BATTERY SYMBOL	VOLTAGE RANGE
-48	45-50V

102.

FEATURE OR OPTION		PROVIDE APP FIG.	APP OR WRG	QUANTITY
CONTROL CKT		1		1 PER CKT
TIMER CKT		2		1 PER CKT
COMPATABILITY WITH RECEIVER OFF-HOOK TONE CONNECTOR CKT	NOT REQ'D		V	
	REQ'D		T	

103.

NETWORK VALUES		
NETWORK NO.	RESISTANCE IN OHMS	CAPACITANCE IN UF

104.

RECORD OF APP FIGURES, WIRING AND APPARATUS CHANGES							
CHANGED ON ISS	IF JOB RECORDS DO NOT SPECIFY	THIS OPTION WAS FURN	SEE NOTE	USE IN CIRCUIT STD	A & M	MD	
3D	2 OR Y	2	304	Y		Z	
5D	X OR W	X		W		X	
8D	V OR T	V	102, 105	V,T			
9D	S OR R	S		R		S	
11B	Q OR P	Q		P		Q	

CIRCUIT NOTES: (CONT)

105. OPTION V SHALL BE FURNISHED WITH TIMER CIRCUIT WHEN MANUFACTURED. OPTION V SHALL BE REMOVED WHEN TIMER CIRCUIT IS CONNECTED TO RECEIVER OFF-HOOK CONNECTOR CIRCUIT - (SD-96322-01) AND ESS NO. 1 OFFICES.

EQUIPMENT NOTES:

201. THE 5A TIMER REQUIRES 2 X 23 INCHES OF MOUNTING PLATE SPACE.

INFORMATION NOTES:

301. UNLESS OTHERWISE SPECIFIED:
RESISTANCE VALUES ARE IN OHMS,
CAPACITANCE VALUES ARE IN MICROFARADS,
VALUES PRECEDED BY THE SYMBOL + (PLUS) OR - (MINUS) ARE IN VOLTS.

302. THE FOLLOWING NOMINAL DC VOLTAGE READINGS TAKEN WITH RESPECT TO -48 VDC [TERM. 11 OF (TB1)] USING A VOLTMETER HAVING A RESISTANCE OF 10 MEGOHMS MINIMUM.

	NOMINAL VOLTAGE READINGS DURING TIME INTERVAL	AFTER TIME INTERVAL WITH START SIGNAL STILL APPLIED
A	RISE TO +18.0	+18.0
B	0	+0.68
C	4.0	+0.8
D	3.8	0
E	+3.3	+48.0

303. ON THE 5A TIMER CHASSIS, THE PRINTED WIRING CARD ASSOCIATED WITH A1,2,3 AND B1,2,3 RELAYS IS THE UPPER CARD. THE LOWER CARD IS ASSOCIATED WITH A4,5,6, AND B4,5,6 RELAYS.

304. 2 AND Y OPTIONS IN P-42E8D7 TIMERS MAY BE USED INTERCHANGEABLY.

305. PRIOR TO ISSUE 4D, THE 5A TIMER WAS CODED APPARATUS.

306. ON ISSUE 3D CHANGES WERE MADE ON TIMER CIRCUIT INDICATING A 2 AND Y OPTION. THIS WAS A CHANGE; NOT AN OPTION. PRIOR TO ISSUE 3D (R201), (R206), AND (R211) WERE 2.61 MEG. ON ISSUE 3D (Q207), (Q208), (Q209), (R216), (R217), AND (R218) WERE ADDED. WIRING OF (Q201), (Q203), AND (Q205) WAS ALSO CHANGED.

SUPPORTING INFORMATION

CATEGORY	NO.
EQUIPMENT DRAWING	J99328A

OPTION INDEX

APP OR WRG	LOCATION
Z	NOTE 306
Y	NOTE 306
X	APP FIG. 2
W	APP FIG. 2
V	2B3,2E3,2G3
T	2A3,2B3,2D3,2E3,2F3,2G3
S	2A0,2D0,2F0
R	2A0,2D0,2F0
Q	APP FIG 2
P	APP FIG 2

DWG ISSUE	EE OR CD ISSUE	DATE ISSUED	DRAWN	APPD
1	1	8-14-63	MCN EDS	MCN FFR DLV
2A	1 APP 1A	6-23-64	WEH HAE	MCN FFR DLV
3D	2D	12-8-65	HVM HVM	FRJ CEP DLV
4D	3D	1-18-67	CPS CRA	WWG CEP RWW
5D	3D APP 1D	10-25-67	JP	WWG WJB RWW
6D	3D APP 2D	11-27-67	DF	EVK CEP RWW
7D	3D APP 3D	10-7-68	JHS HAE	EVK CEP RWW
8D	3D APP 4D	4-9-69	CDC CRA	EJK CEP RWW
9D	4D	4-12-72	CJ HAE	EVK FEF RWW
10D	4D APP 1D	10-20-75	JJC HAE	WEM AB JEB
11B	4D APP 2B	8-8-78	WJG WJG	WF AB DLV
12D	4D APP 3D	8-8-78	WJG WJG	WF AB DLV

12D

SD-99304-01 IN99

COMMON SYSTEMS

5A TIMER CIRCUIT

5A TMR

AT&TCO STANDARD

SD-99304-01-1
5 SHEETS

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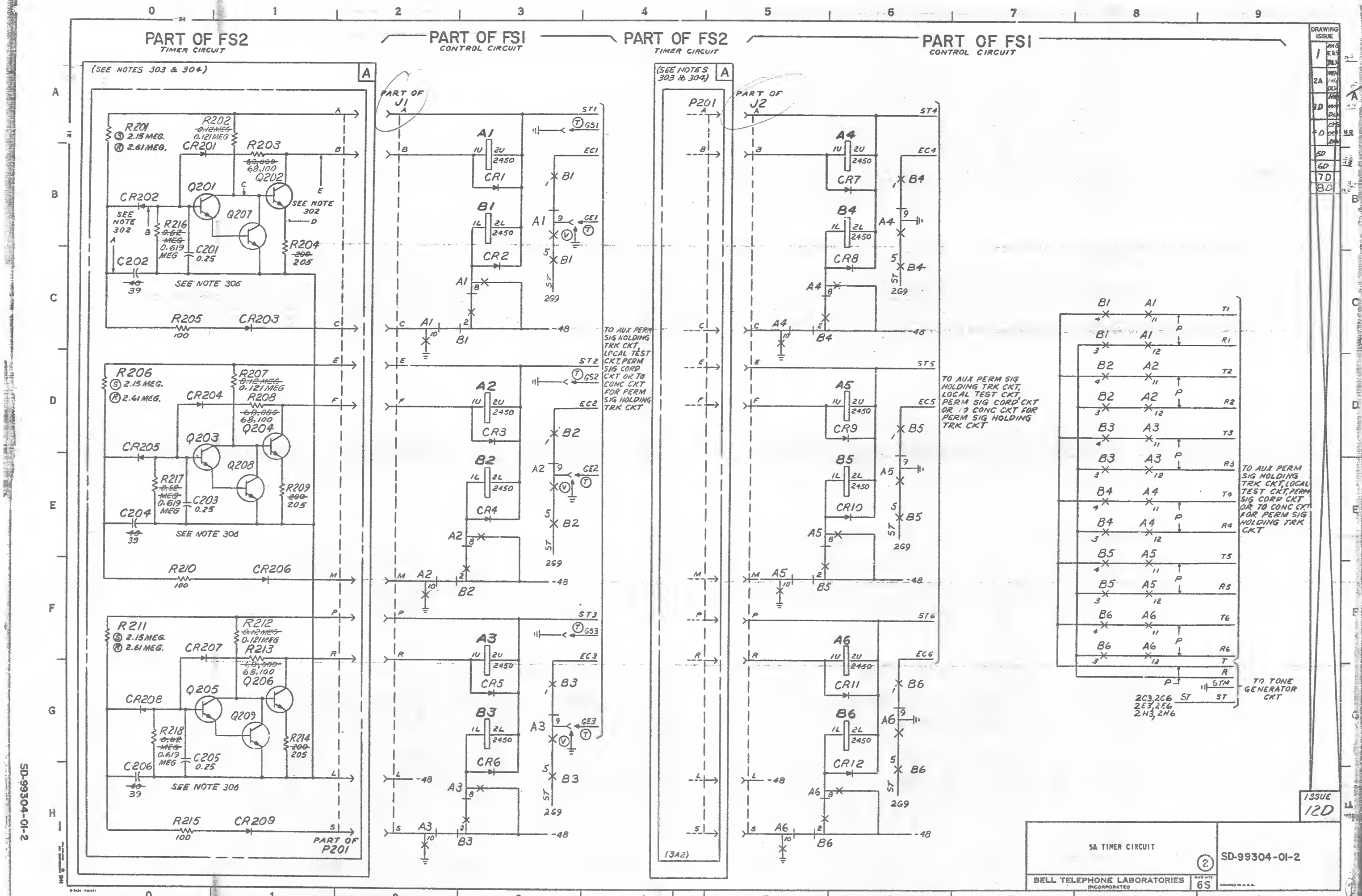
SD-99304-01-1


PART OF FS2
TIMER CIRCUIT
PART OF FS1
CONTROL CIRCUIT
PART OF FS2
TIMER CIRCUIT
PART OF FS1
CONTROL CIRCUIT
(SEE NOTES 303 & 304)
(SEE NOTES 303 & 304)
PART OF J1
PART OF J2
P201
R201 (S) 2.15 MEG. (R) 2.61 MEG.
R202 0.121 MEG
R203 68,100
CR201
CR202
Q201
Q202
Q207
SEE NOTE 302
R216 0.619 MEG
C201 0.25
R204 205
C202 39
SEE NOTE 306
R205 100
CR203
R206 (S) 2.15 MEG. (R) 2.61 MEG.
R207 0.121 MEG
R208 68,100
CR204
Q203
Q204
Q208
CR205
R217 0.619 MEG
C203 0.25
R209 205
C204 39
R210 100
CR206
R211 (S) 2.15 MEG. (R) 2.61 MEG.
R212 0.121 MEG
R213 68,100
CR207
Q205
Q206
Q209
CR208
R218 0.619 MEG
C205 0.25
R214 205
C206 39
R215 100
CR209
PART OF P201
(3A2)
A1 1U 2U 2450
CR1
B1 1L 2L 2450
CR2
A2 1U 2U 2450
CR3
B2 1L 2L 2450
CR4
A3 1U 2U 2450
CR5
B3 1L 2L 2450
CR6
A4 1U 2U 2450
CR7
B4 1L 2L 2450
CR8
A5 1U 2U 2450
CR9
B5 1L 2L 2450
CR10
A6 1U 2U 2450
CR11
B6 1L 2L 2450
CR12
ST1 GS1 EC1 GE1
ST2 GS2 EC2 GE2
ST3 GS3 EC3 GE3
ST4 EC4
ST5 EC5
ST6 EC6
2G9
-48
TO AUX PERM SIG HOLDING TRK CKT, LOCAL TEST CKT, PERM SIG CORD CKT OR TO CONC CKT FOR PERM SIG HOLDING TRK CKT
TO AUX PERM SIG HOLDING TRK CKT, LOCAL TEST CKT, PERM SIG CORD CKT OR TO CONC CKT FOR PERM SIG HOLDING TRK CKT
T1 R1 T2 R2 T3 R3 T4 R4 T5 R5 T6 R6
TO AUX PERM SIG HOLDING TRK CKT, LOCAL TEST CKT, PERM SIG CORD CKT OR TO CONC CKT FOR PERM SIG HOLDING TRK CKT
STM
TO TONE GENERATOR CKT
2C3, 2C6, 2E3, 2F6, 2H3, 2H6
DRAWING ISSUE
ISSUE 12D
5A TIMER CIRCUIT
SD-99304-01-2
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6S
SD-99304-01-2

APP FIG. 1

RELAY

DESIG	A1		B1		A2		B2		A3		B3	
CODE	AK4				AK4				AK4			
OPTION												
	CONT ARR	LOC	CONT ARR	LOC	CONT ARR	LOC	CONT ARR	LOC	CONT ARR	LOC	CONT ARR	LOC
12	M	2C3			M	2D8			M	2E8		
11	EBM	2C3			EBM	2D8			EBM	2D8		
10	EBM	2C2			EBM	2F2			EBM	2H2		
9	EMB	2B3			EMB	2E3			EMB	2G3		
8	EMB	2C3			EMB	2E3			EMB	2N2		
7												
6												
5			EMB	2C3			EMB	2E3			EMB	2G3
4			EMB	2C8			EMB	208			EMB	208
3			EBM	2C8			EBM	208			EBM	2E8
2			EBM	2C3			EBM	2F3			EBM	2H3
1			M	2B3			M	2D3			M	2G3
COIL		2A3		2B3		2D3		2E3		2F3		2G3

A4		B4		A5		B5		A6		B6		DESIG
AK4				AK4				AK4				CODE
												OPTION
CONT ARR	LOC	CONT ARR	LOC	CONT ARR	LOC	CONT ARR	LOC	CONT ARR	LOC	CONT ARR	LOC	
M	2E8			M	2F8			M	2F8			12
EBM	2E8			EBM	2E8			EBM	2F8			11
EBM	2C5			EBM	2F5			EBM	2H5			10
EMB	2B6			EMB	2D6			EMB	2G6			9
EMB	2C5			EMB	2E5			EMB	2H5			8
												7
												6
		EMB	2C6			EMB	2E6			EMB	2G6	5
		EMB	2E8			EMB	2E8			EMB	2F8	4
		EBM	2E8			EBM	2F8			EBM	2F8	3
		EBM	2C5			EBM	2F5			EBM	2N5	2
		M	2B6			M	2D6			M	2G6	1
	2A6		2B6		2D6		2E6		2F6		2G6	COIL

CONNECTOR
KS-16345,L2

+ S R P N M L K J H F E D C B A +

DESIG		J1	J2
CONN	SOCKET		
OPTION			
	NO.	LOC	LOC
	S	2H2	2H5
	R	2F2	2F5
	P	2F2	2F5
	N		
	M	2F2	2F5
	L	2H2	2H5
	K		
	J		
	N		
	F	2D2	2D5
	E	2D2	2D5
	D		
	C	2C2	2C5
	B	2B2	2B5
	A	2A2	2A5

DIODE

DESIG	LOC	CODE
CR1	2B3	
CR2	2C3	
CR3	2D3	
CR4	2E3	
CR5	2G3	
CR6	2G3	~~446F~~ 533F
CR7	2B6	
CR8	2C6	
CR9	2D6	
CR10	2E6	
CR11	2G6	
CR12	2G6	

APP FIG. 2

[2]ED-99655-30 TIMER,(PRINTED WIRING BOARDS ASSEMBLY) (SEE NOTE 1)

CAPACITOR

DESIG	LOC	CODE
C201	2C0	542C
(X) C202	2C0	602E
(W) C202	2C0	~~SPRAGUE~~ 614C ~~109D406X9030F2 40 UF 30V~~
C203	2E0	542C
(X) C204	2E0	602E
(W) C204	2E0	~~SPRAGUE~~ 614C ~~109D406X9030F2 40 UF 30V~~
C205	2G0	542C
(X) C206	2H0	602E
(W) C206	2H0	~~SPRAGUE~~ 614C ~~109D405X9030F2 40 UF 30V~~

CONNECTOR
KS-16345,L1

+ S R P N H L K J H F E D C B A +

DESIG	P201
CONN	PLUG
OPTION	
NO.	LOC
S	2H2
R	2F2
P	2F2
N	
M	2F2
L	2H2
K	
J	
H	
F	2D2
E	2D2
D	
C	2C2
B	2B2
A	2A2

DIODE

DESIG	LOC	CODE
CR201	2B0	~~446N~~ 808AF
CR202	2B0	~~446E~~ 808AD
CR203	2C1	~~446F~~ 533F
CR204	2D0	~~446N~~ 808AF
CR205	2D0	~~446E~~ 808AD
CR206	2F1	~~446F~~ 533F
CR207	2F0	~~446N~~ 808AF
CR208	2G0	~~446E~~ 808AD
CR209	2H1	~~446F~~ 533F

RESISTOR

DESIG	LOC	CODE
(S) R201	2A0	145A,2.15 MEG
(R) R201	2A0	~~145A,263A,2.61 MEG~~ 263A,2.61 MEG
R202	2A1	~~KS-13490,L1,0.12 MEG~~ KS-20810,L1A,0.121MEG
R203	2B1	~~KS-13490,L1,68,000~~ ~~KS-19150,L1,68,000~~ KS-20810,L1A,68,100
R204	2B1	~~KS-13490,L1,200~~ KS-20810,L1A,205
R205	2C0	~~KS-13490,L1,100~~ KS-20810.L1A,100
(S) R206	2D0	145A,2.15 MEG
(R) R206	2D0	~~145A263A,2.61MEG~~ 263A,2.61 MEG
R207	2D1	~~KS-13490,L1,0.12 MEG~~ KS-20810,L1A,0.121 MEG
R208	2D1	~~KS-13490,L1,68,000~~ ~~KS-19150,L1,68,000~~ KS-20810,L1A,68,100
R209	2E1	~~KS-13490,L1,200~~ KS-20810,L1A,205
R210	2F0	~~KS-13490,L1,100~~ KS-20810,L1A,100
(S) R211	2F0	145A,2.15 MEG
(R) R211	2F0	~~145A263A,2.61MEG~~ 263A,2.61 MEG
R212	2F1	~~KS-13490,L1,0.12 MEG~~ KS-20810,L1A,0.121 MEG
R213	2F1	~~KS-13490,L1,68,000~~ ~~KS-19150,L1,68,000~~ KS-20810,L1A,68,100
R214	2G1	~~KS-13490,L1,200~~ KS-20810,L1A,205
R215	2N0	~~KS-13490,L1,100~~ KS-20810,L1A,100
R216	2B0	~~KS-13490,L1,0.62 MEG~~ KS-20810,L1A,0.619 MEG
R217	2E0	~~KS-13490,L1,0.62 MEG~~ KS-20810,L1A,0.619 MEG
R218	2G0	~~KS-13490,L1,0.62 MEG~~ KS-20810,L1A,0.619 MEG

TRANSISTOR

DESIG	LOC	CODE
Q201	2B0	16F OR 29A OR 66S
(Q) Q202	2B1	16F OR 29A OR 66S
Q203	2D0	16F OR 29A OR 66S
(Q) Q204	2D1	16F OR 29A OR 66S
Q205	2G0	16F OR 29A OR 66S
(Q) Q206	2G1	16F OR 29A OR 66S
Q207	2B1	29A OR 66S
Q208	2E1	29A OR 66S
Q209	2G1	29A OR 66S
(P) Q202	2B1	66U
(P) Q204	2D1	66U
(P) Q206	2G1	66U

NOTES:

1. PRIOR TO ISSUE 4D THE ED-99655-30 TIMER WAS THE P-42EB07 TIMER.

DRAWING ISSUE: 1, 2A, 3D, 4D, 5D, 6D, 7D, 8D

ISSUE 12D

5A TIMER CIRCUIT (2)

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6S

SD-99304-01-3

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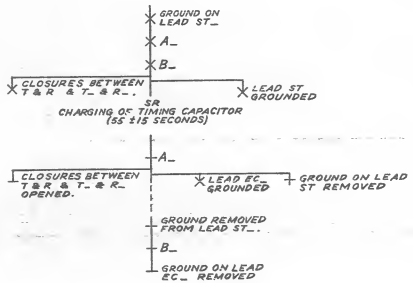
SD-99304-01-3

SC 1



DRAWING ISSUE

1	
2A	
3D	
4D	
5D	
6D	
7D	
8D	

ISSUE 12D

5A TIMER CIRCUIT

BELL TELEPHONE LABORATORIES INCORPORATED

SD-99304-01-4

SD-99304-01-4

SD-99304-01

CIRCUIT REQUIREMENTS

5A TIMER CIRCUIT

APPARATUS DESIG	CODE	OPT	FIG.	MECH REQT BSP FIG.	CONT PRESS.	ARM. TRVL.	CIRCUIT PREPARATION BLOCK OR INSULATE	TEST CLIP DATA CONN BAT.	CONN GRD	TEST SET PREP	SEE TEST NOTE	DIRECT CURRENT FLOW REQT TEST WDG	TEST FOR	AFTER SOAK MA.	TEST MA.	READJ MA.	REMARKS
RELAYS																	
A1	1/2AK4		1	202				1U(A1)	2U(A1)	B/G	1,2	T	O		11.9	11.3	MOUNTED WITH (B1)
A2	1/2AK4		1	202				1U(A2)	2U(A2)	B/G	1,2	T	O		11.9	11.3	MOUNTED WITH (B2)
A3	1/2AK4		1	202				1U(A3)	2U(A3)	B/G	1,2	T	O		11.9	11.3	MOUNTED WITH (B3)
A4	1/2AK4		1	202				1U(A4)	2U(A4)	B/G	1,2	T	O		11.9	11.3	MOUNTED WITH (B4)
A5	1/2AK4		1	202				1U(A5)	2U(A5)	B/G	1,2	T	O		11.9	11.3	MOUNTED WITH (B5)
A6	1/2AK4		1	202				1U(A6)	2U(A6)	B/G	1,2	T	O		11.9	11.3	MOUNTED WITH (B6)
B1	1/2AK4		1	202				1L(B1)	2L(B1)	B/G	1,2	B	O		11.9	11.3	MOUNTED WITH (A1)
B2	1/2AK4		1	202				1L(B2)	2L(B2)	B/G	1,2	B	O		11.9	11.3	MOUNTED WITH (A2)
B3	1/2AK4		1	202				1L(B3)	2L(B3)	B/G	1,2	B	O		11.9	11.3	MOUNTED WITH (A3)
B4	1/2AK4		1	202				1L(B4)	2L(B4)	B/G	1,2	B	O		11.9	11.3	MOUNTED WITH (A4)
B5	1/2AK4		1	202				1L(B5)	2L(B5)	B/G	1,2	B	O		11.9	11.3	MOUNTED WITH (A5)
B6	1/2AK4		1	202				1L(B6)	2L(B6)	B/G	1,2	B	O		11.9	11.3	MOUNTED WITH (A6)

DRAWING ISSUE: 1, 2A, 3D, 4D, 5D, 6D, 7D, 8D — ISSUE 12D

TEST NOTES:

1. REMOVE PRINTED WIRING BOARDS.
2. REMOVE CENTRAL OFFICE BATTERY FROM TERM. 11 OF (TB1).

5A TIMER CIRCUIT — SD-99304-01-5

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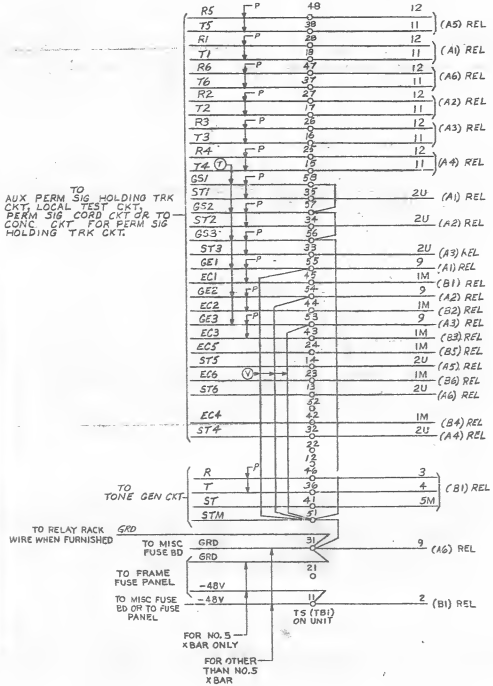
CAD. 1

(FOR APP FIG. 1)



DRAWING ISSUE: 1, 2A, 3D, 4D, 5D, 6D, 7D, 8D — ISSUE 12D

5A TIMER CIRCUIT — (2) SD-99304-01-5

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